



Title

rdwinselect — Window selection procedure for RD designs under local randomization.

Syntax

```
rdwinselect runvar [covariates] [if] [in] [, cutoff(#) obsmin(#) wmin(#) wobs(#)
wstep(#) wmasspoints nwindows(#) statistic(stat_name) p(#) evalat(point)
kernel(kerneltype) approximate level(#) reps(#) seed(#) plot
graph_options(graphopts) genvars obsstep(#) ]
```

Description

rdwinselect implements window selection procedure based balance tests for regression discontinuity (RD) designs under local randomization. Specifically, it constructs a sequence of nested windows around the RD cutoff and reports binomial tests for running variable *runvar* and covariate balance tests for covariates *covariates* (if specified). The recommended window is the largest window around the cutoff such that the minimum p-values of the balance tests is larger than a pre-specified level for all nested (smaller) windows. By default, the p-values are calculated employing randomization inference methods. See [Cattaneo, Frandsen and Titiunik \(2015\)](#) and [Cattaneo, Titiunik and Vazquez-Bare \(2017\)](#) for an introduction to this methodology.

A detailed introduction to this command is given in [Cattaneo, Titiunik and Vazquez-Bare \(2016\)](#).

Companion R functions are also available [here](#).

Companion functions are [rdrandinf](#), [rdsensitivity](#) and [rdrbounds](#).

Related Stata and R packages useful for inference in RD designs are described in the following website:

<https://sites.google.com/site/rdpackages/>

Options

cutoff(#) specifies the RD cutoff for the running variable *runvar*. Default is **cutoff(0)**.

_____ Window selection _____

obsmin(#) specifies the minimum number of observations above and below the cutoff in the smallest window. Default is **obsmin(10)**.

wmin(#) specifies the smallest window to be used (if **obsmin**(#) is not specified). Specifying both **wmin**(#) and **obsmin**(#) returns an error.

wobs(#) specifies the number of observations to be added at each side of the cutoff at each step. Default is **wobs(5)**.

wstep(#) specifies the increment in window length. Specifying both **wobs**(#) and **wstep**(#) returns an error.

wmasspoints specifies that the running variable is discrete and each masspoint should be used as a window.

nwindows(#) specifies the number of windows to be used. Default is **nwindows(10)**.

_____ Statistic _____

statistic(*stat_name*) specifies the statistic to be used. Options are:
diffmeans for difference in means statistic. This is the default option.
ksmirnov for Kolmogorov-Smirnov statistic.
ranksum for Wilcoxon-Mann-Whitney studentized statistic.
hotelling for Hotelling's T-squared statistic.
The option **ttest** is equivalent to **diffmeans** and included for backward compatibility.

p(#) specifies the order of the polynomial for outcome adjustment model. Default is **p(0)**.

evalat(*point*) specifies the point at which the adjusted variable is evaluated. Allowed options are **cutoff** and **means**. Default is **evalat(cutoff)**.

kernel(*kerneltype*) specifies the type of kernel to use as weighting scheme. Allowed kernel types are **uniform** (uniform kernel), **triangular** (triangular kernel) and **epan** (Epanechnikov kernel). Default is **kernel(uniform)**.

Inference

approximate specifies that covariate balance tests should use a large-sample approximation instead of finite-sample exact randomization inference methods.

level(#) specifies the minimum accepted value of the p-value from the covariate balance tests to be used. Default is **level(.15)**.

reps(#) specifies the number of replications to be used. Default is **reps(1000)**.

seed(#) sets the seed for the randomization test. With this option, the user can manually set the desired seed, or can enter the value -1 to use the system seed. Default is **seed(666)**.

Generate plots and variables

plot draws a scatter plot of the minimum p-value from the covariate balance test against window length implemented by the command.

graph_options(*graphopts*) graph options for plot generated by the command.

genvars generates a variable indicating the window number corresponding to each observation and a variable indicating the corresponding window length.

Backward compatibility

obsstep(#) specifies the minimum number of observations to be added on each side of the cutoff. This option is deprecated and only included for backward compatibility. We recommend the use of **wstep** or **wobs** instead.

Example: Cattaneo, Frandsen and Titiunik (2015) Incumbency Data

Setup

```
. use rdlocrand_senate.dta
```

Window selection with three covariates and default options

```
. rdwinselect demmv dopen population demvoteslag1
```

Window selection using Kolmogorov-Smirnov statistic

```
. rdwinselect demmv dopen population demvoteslag1, stat(ksmirnov)
```

Window selection with smallest window including at least 10 observations in each group and adding 3 observations in each step

```
. rdwinselect demmv dopen population demvoteslag1, obsmin(10) wobs(3)
```

Window selection setting smallest window at .5 and with .125 length increments
`. rdwinselect demmv dopen population demvoteshlag1, wmin(.5) wstep(.125)`

Window selection with asymptotic p-values using 40 windows with scatter plot
`. rdwinselect demmv dopen population demvoteshlag1, nwindows(40) approximate plot`

Modify graph options: add title and x-axis label
`. rdwinselect demmv dopen population demvoteshlag1, nwindows(40) approx plot graph_options(title(Main title) xtitle(x-axis title))`

Saved results

`rdwinselect` saves the following in `r()`:

Scalars

<code>r(minp)</code>	minimum p-value from covariate test
<code>r(N)</code>	sample size in recommended window
<code>r(N_left)</code>	sample size in recommended window to the left of the cutoff
<code>r(N_right)</code>	sample size in recommended window to the right of the cutoff
<code>r(w_left)</code>	left end of recommended window
<code>r(w_right)</code>	right end of recommended window
<code>r(wobs)</code>	when specified, increment (in observations) in each window
<code>r(wmin)</code>	initial window
<code>r(wstep)</code>	when specified, increment (in window length) in each window
<code>r(nwindows)</code>	total number of windows evaluated

Locals

<code>r(seed)</code>	seed used in permutations
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Matrices

<code>r(wlist)</code>	matrix with window lengths
<code>r(results)</code>	stores the minimum p-value from covariate balance test, p-value from binomial test, sample sizes and window length in each window

References

- Cattaneo, M. D., Frandsen, B., and R. Titiunik. 2015. Randomization Inference in the Regression Discontinuity Design: An Application to Party Advantages in the U.S. Senate. *Journal of Causal Inference* 3(1): 1-24.
- Cattaneo, M.D., Titiunik, R. and G. Vazquez-Bare. 2016. Inference in Regression Discontinuity Designs under Local Randomization. *Stata Journal* 16(2): 331-367.
- Cattaneo, M. D., Titiunik, R. and G. Vazquez-Bare. 2017. Comparing Inference Approaches for RD Designs: A Reexamination of the Effect of Head Start on Child Mortality. *Journal of Policy Analysis and Management* 36(3): 643-681.

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